

Rhopalocera and Grypocera of Turkey 10.

Description of the female of *Thymelicus novus* (REVERDIN, 1916) and additional notes on the female genitalia of some *Thymelicus* species (Lepidoptera : Hesperiiidae)

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Samenvatting. Beschrijving van het wijfje van *Thymelicus novus* (REVERDIN, 1916) en verdere gegevens over de vrouwelijke genitalia van enkele *Thymelicus* soorten (Lepidoptera : Hesperiiidae)

Het vrouwtje van *Thymelicus novus* (REVERDIN, 1916) wordt beschreven. De vrouwelijke genitalia van *Thymelicus hyrax* (LEDERER, 1861) worden beschreven en verschillen in de structuur van de tergieten 8 en 9+10 van alle uit Turkije vermelde *Thymelicus*-soorten en van *Thymelicus hamza* (OBERTHÜR, 1876) worden besproken en afgebeeld.

Résumé. Description de la femelle de *Thymelicus novus* (REVERDIN, 1916) avec notes sur les génitalia femelle de quelques autres espèces du genre *Thymelicus* (Lepidoptera : Hesperiiidae)

L'article comprend la description de la femelle de *Thymelicus novus* (REVERDIN, 1916), ainsi que celle des génitalia femelle de *Thymelicus hyrax* (LEDERER, 1861). Des différences dans les structures des tergites 8 et 9+10 de toutes les espèces du genre *Thymelicus* connues de Turquie, ainsi que de *Thymelicus hamza* (OBERTHÜR, 1876) sont commentées et figurées.

Key words: *Thymelicus novus* - Turkey - female genitalia.

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Introduction

During several expeditions to eastern Turkey the first two authors observed *Thymelicus novus* (REVERDIN, 1916) on several occasions in the provinces of Artvin, Erzurum and Hakkâri. A more detailed account of the distribution of the species will be given in WAGENER, VAN OORSCHOT & HESSELBARTH (in print). The specimens usually concentrated on damp places along sandy roads and appeared all to be males, a well known phenomenon in especially Hesperiiidae and Lycaenidae. During our summer excursion of 1991 we passed through the province of Tunceli. In flowery meadows we noticed all known Turkish *Thymelicus* species. In this locality the butterflies were not attracted to the water, though a river ran at about 100 m. Settled specimens were only attracted by flowers.

The presence of several *Thymelicus* spp. females on the flowers prompted us to concentrate our activities on the search of the still unknown female of *T. novus*. After careful examination in this most interesting locality four female *Thymelicus* were secured that could not be ascribed to any of the extant Turkish *Thymelicus* species. As male *T. novus* were also observed there we logically concluded that these females must belong to *T. novus*. After examination of external characters and genitalia, these specimens appeared to show constant differences as compared to the other relevant species. During

the expedition of 1992 two more females were caught in the province of Hakkâri. The female of *T. novus* still being undescribed, the following is intended to fill this gap in our knowledge.

DE JONG (1984) described and figured the diagnostic characters of the male of *T. novus* as compared to the remaining *Thymelicus* species and confirmed its distinct species status. Our present study of the female gives additional support to the specific distinction of *T. novus*. As *T. novus* has been considered a subspecies of *T. hamza* (OBERTHÜR, 1876) in the past (cf. EVANS 1949), we also describe and illustrate the female genitalia of *T. hamza*, a taxon that is restricted to North Africa.

Description of the female of *Thymelicus novus* (REVERDIN, 1916)

External characters (see plate 1, figs 6-9): looks like *T. sylvestris* (PODA, 1761) but on average smaller, same size as in *T. acteon* (ROTTEMBURG, 1775) and *T. hamza*, groundcolour somewhat darker brown; upperside forewing space between vein 2 and inner margin darker; discoidal veins much more pronounced than in all other Turkish *Thymelicus* species, resembling most *T. hamza*; costal veins well marked, as in *T. acteon*. No yellow median spots in spaces 2 or 3 to 8 on upper- and underside forewing as in *T. acteon*.

Underside forewing like in *T. acteon*, somewhat paler; black basal spot as in *T. acteon*; underside hindwing unicolourous (as stated in the original description of the male by REVERDIN 1916: 123), as in *T. acteon* but deeper orange.

Palpae: first and second segments pure white with some black hairs, towards the base of the third segment some yellow-orange scales, much lesser than in the male, resembling very much the palpal segments of *T. hamza* and *T. acteon*; no clear-cut differences could be found between these three species. In the female of *T. hyrax* the first and second segments are covered with lemon yellow scales. In the female of *T. lineola* (OCHSENHEIMER, 1808) and *T. sylvestris* the scales are pure white throughout.

Antennal nudum pale brown, similar to that of *T. sylvestris* (cf. DE JONG 1984: 159, fig. 28).

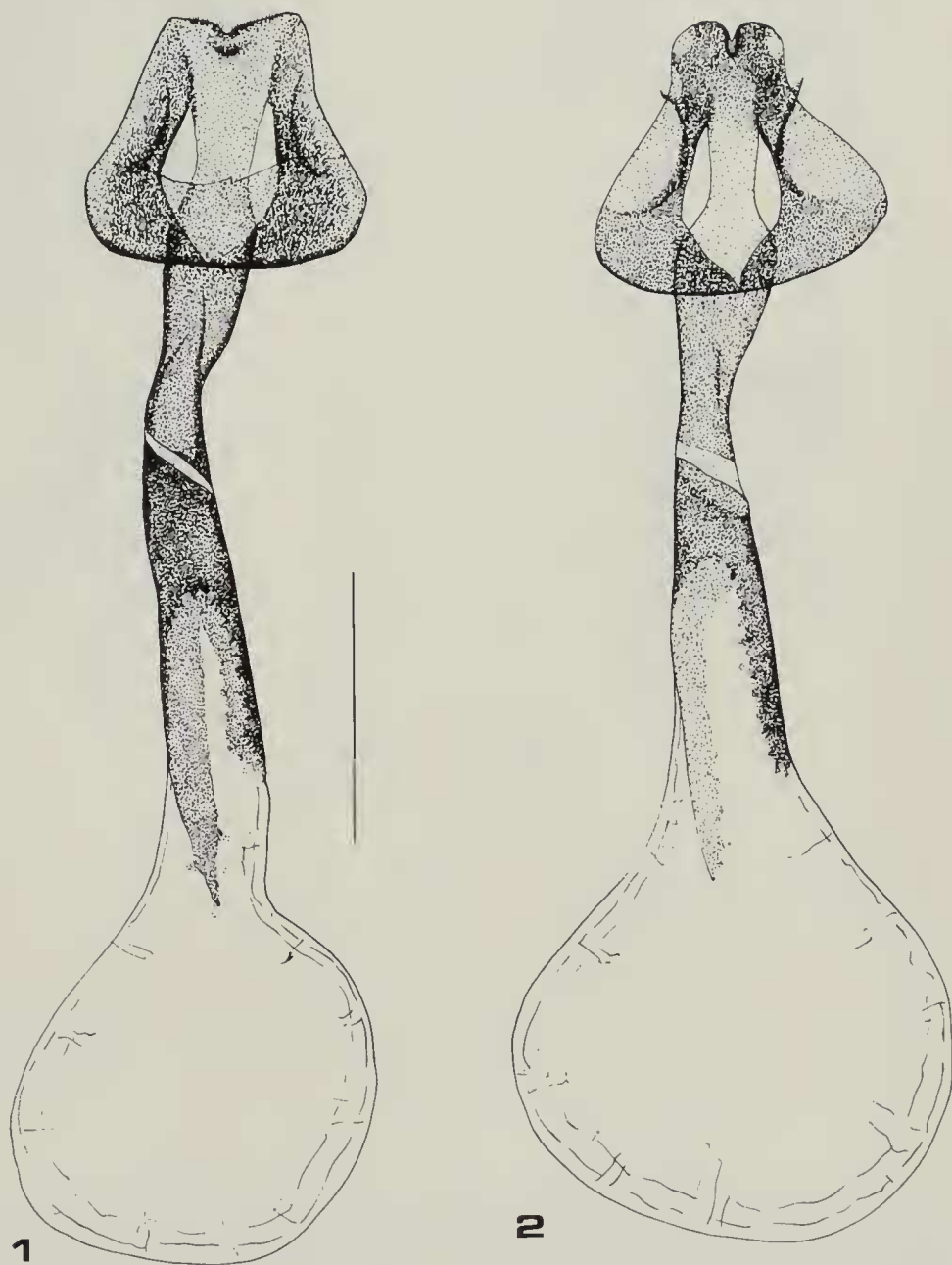
Variation: In the north-eastern provinces of Turkey male specimens (see plate 1, figs 1-3) are constantly darker than those of south-eastern Turkey (see plate 1, figs 4-5). In two female specimens, caught in the province of Hakkâri the groundcolour does not differ from that of north-eastern Turkish females, but on upperside forewing discoidal veins are less well developed. Thus far, no specimens of *T. novus* are known from the region between the provinces of Hakkâri and Erzurum (prov. Ağrı, Bingöl, Kars, Van), with the exception of one locality in the south of the province of Van close to Hakkâri.

Female genitalia (figs 1, 7, 13):

Sterigma trapezium shaped, apically slightly indented, smooth except for a small area with microtrichia at both sides of antrum; colliculum cylindric, slightly narrowing towards ductus, twice as long as wide; ductus cylindric, about 6 times as long as wide, bifurcate from about 1/3; bursa spheroid, no signum (fig. 1).

Papillae anales trapezium shaped, distal part with short microtrichia, dorsally with some long spines; apophyses posteriores 1.9 times as long as distal part of papillae anales; hook at 1/3 of distal end (fig. 7).

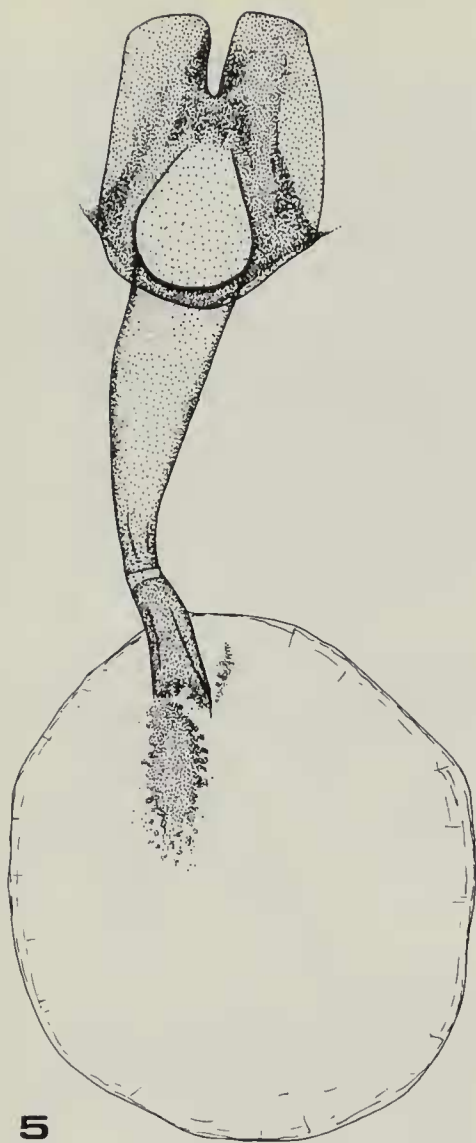
8th tergite rectangular, twice as long as wide, costa with long setae, round incision laterally; apophyses anteriores 1.3 times as long as width of tergite (fig. 13).



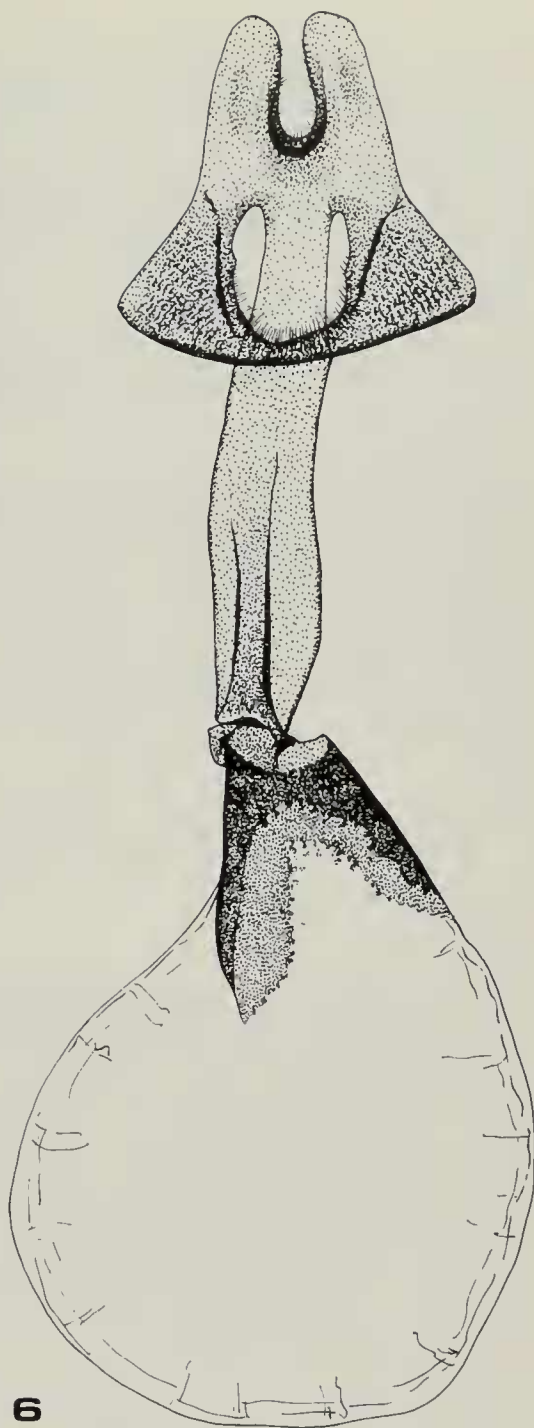
Figs 1, 2: Female genitalia (sterigma, colliculum, ductus bursae, bursa): 1. *Thymelicus novus* (REVERDIN, 1916), Turkey, prov. Tunceli, 5 km S. of Tanyeri, 1200-1300 m, 21.VII.1991, St. 735, D. VAN DER POORTEN & W. DE PRINS leg. [prep. WDP 3127]; 2. *Thymelicus acteon* (ROTTEMBURG, 1775), same data [prep. WDP 3131], scale line 1 mm.



Figs 3, 4: Female genitalia (sterigma, colliculum, ductus bursae, bursa): 3. *Thymelicus hamza* (OBERTHÜR, 1876), Morocco, Great Atlas, Oukaïmeden, 2300 m, 8.VII.1984, W. DE PRINS leg. [prep. WDP 3129]; 4. *Thymelicus sylvestris* (PODA, 1761), same data as fig. 1 [prep. WDP 3126], scale line 1 mm.



5



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Figs 5, 6: Female genitalia (sterigma, colliculum, ductus bursae, bursa): 5. *Thymelicus lineola* (OCHSENHEIMER, 1808), same data as fig. 1 [prep. WDP 3125]; 6. *Thymelicus hyrax* (LEDERER, 1861), Turkey, prov. Konya, Palazdağı, Taşkent, 1500-1600 m, 25.VII.1991, St. 745, D. VANDER POORTEN & W. DE PRINS leg. [prep. WDP 3128], scale line 1 mm.

Some notes on the female genitalia of other *Thymelicus* species

Illustrations of female genitalia of *Thymelicus* species are very scarce in the entomological literature. DE JONG (1984) gives good figures and descriptions of the sterigma, colliculum and ductus bursae of five *Thymelicus* species, of which three occur in Turkey. In this paper we illustrate and describe the same structures of *Thymelicus hyrax* (LEDERER, 1861) and furthermore the structures of the segments 8 and 9+10 of the five *Thymelicus* species which are currently known to occur in Turkey, and of *T. hamza*. We also illustrate the sterigma, colliculum, ductus bursae and bursa of all known Turkish *Thymelicus* species, all but one (*T. hyrax*) caught in the same locality.

T. hyrax (figs 6, 12, 18):

Sterigma, trapezium shaped, with deep apical incision to 1/3 length of sterigma, narrow antevaginal area; inner side of incision and antevaginal area with short microtrichia; colliculum cylindriciform, slightly narrowing towards ductus, 3.5 times as long as wide; ductus short, twice as long as wide, almost completely bifurcate; bursa elongate-ellipsoid, no signum (fig. 6).

Papillae anales triangular, distal and dorsal parts more strongly sclerotized, dorsal side with spines not as long as in *T. novus*; apophyses posteriores very slender, 2.5 times as long as distal part of papillae anales, no apparent hook (fig. 12).

8th tergite trapezium shaped, 1.2 times as long as wide, costa with long hairs, no round incision laterally; apophyses anteriores 1.4 times as long as width of tergite (fig. 18).

Legend of plates 1 and 2:

Figs 1-5: *Thymelicus novus* (REVERDIN, 1916) males:

1. Turkey, prov. Erzurum, Ovıt Geçidi, 4-10 km NW İspir, 1200-1500 m, 12.VII.1991, St. 720, W. DE PRINS, D. VAN DER POORTEN & A. RIEMIS leg.; 2. idem as fig. 1; 3. Turkey, prov. Tunceli, 5 km S Tanyeri, 1200-1300 m, 21.VII.1991, St. 735, D. VAN DER POORTEN & W. DE PRINS leg.; 4. Turkey, prov. Hakkâri, 10-20 km SW Hakkâri, Zap valley, 1500 m, 16-25.VI.1990, St. 540, A. RIEMIS & D. VAN DER POORTEN leg.; 5. idem as fig. 4.

Figs 6-9: *Thymelicus novus* (REVERDIN, 1916) females: same data as fig. 3.

Fig. 10: *Thymelicus hamza* (OBERTHÜR, 1876) male: Tunisia, Sousse, 7.V.1985, K. MYNCKE leg.

Figs 11-14: *Thymelicus acteon* (ROTTEMBURG, 1775):

11. female, same data as fig. 3; 12. female, Greece, Rodos, Psinthos, 7.VI.1984, D. VAN DER POORTEN leg.; 13. female, Greece, Argolis, Achladocampos, 10.V.1977, D. VAN DER POORTEN leg.; 14. male, same data as fig. 3.

Fig. 15: *Thymelicus hamza* (OBERTHÜR, 1876) female: Tunisia, Sousse, 12.VI.1976, K. MYNCKI leg.

Figs 16-19: *Thymelicus lineola* OCHSENHEIMER, 1808):

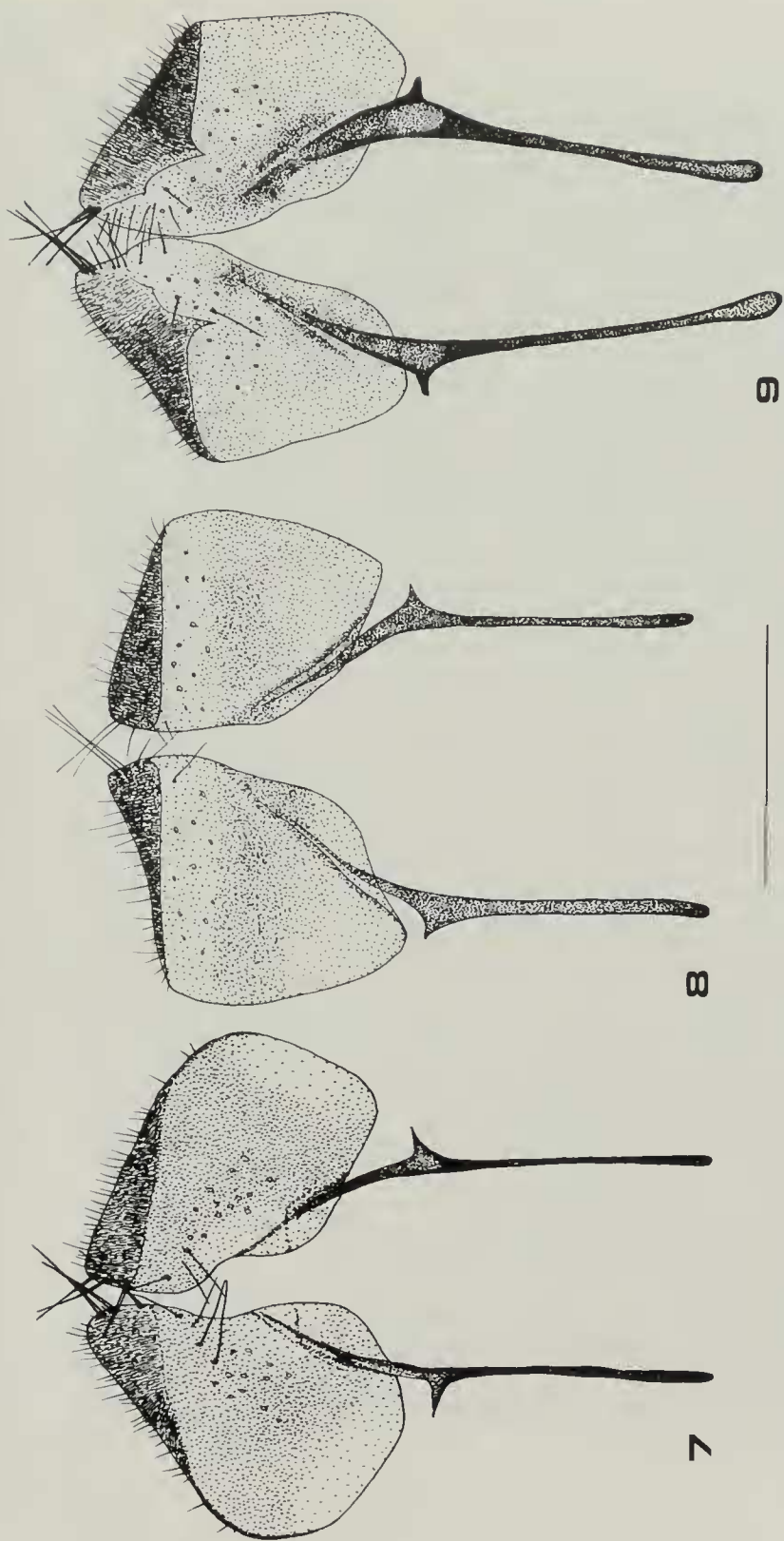
16-18. females, same data as fig. 3; 19. male, same data as fig. 1.

Fig. 20: *Thymelicus hyrax* (LEDERER, 1861) male: Turkey, prov. Erzurum, 12-25 km NE İspir, Çoruh valley, 1400 m, 4.VII.1991, St. 710, W. DE PRINS, D. VAN DER POORTEN & A. RIEMIS leg.

Figs 21-24: *Thymelicus sylvestris* (PODA, 1761):

21. female, same data as fig. 4; 22. female, Greece, Kastoria, ca 25 km N. Kastoria, 13.VII.1989, D. VAN DER POORTEN leg.; 23. female, Greece, Achaia, Kalavrita, 22.VI.1988, D. VAN DER POORTEN leg.; 24. male, same data as fig. 1.

Fig. 25: *Thymelicus hyrax* (LEDERER, 1861) female: Turkey, prov. Artvin, Çoruh valley, 14 km SW Yusufeli, 1000 m, St. 726, D. VAN DER POORTEN & W. DE PRINS leg.



Figs 7-9: Papillae anales, apophyses posteriores: 7. *Thymelicus novus* (REVERDIN, 1916), same data as fig. 1; 8. *Thymelicus acteon* (ROTTEMBURG, 1775), same data as fig. 2; 9. *Thymelicus hamza* (OBERTHÜR, 1876), same data as fig. 3; scale line 1 mm.

Plate 1

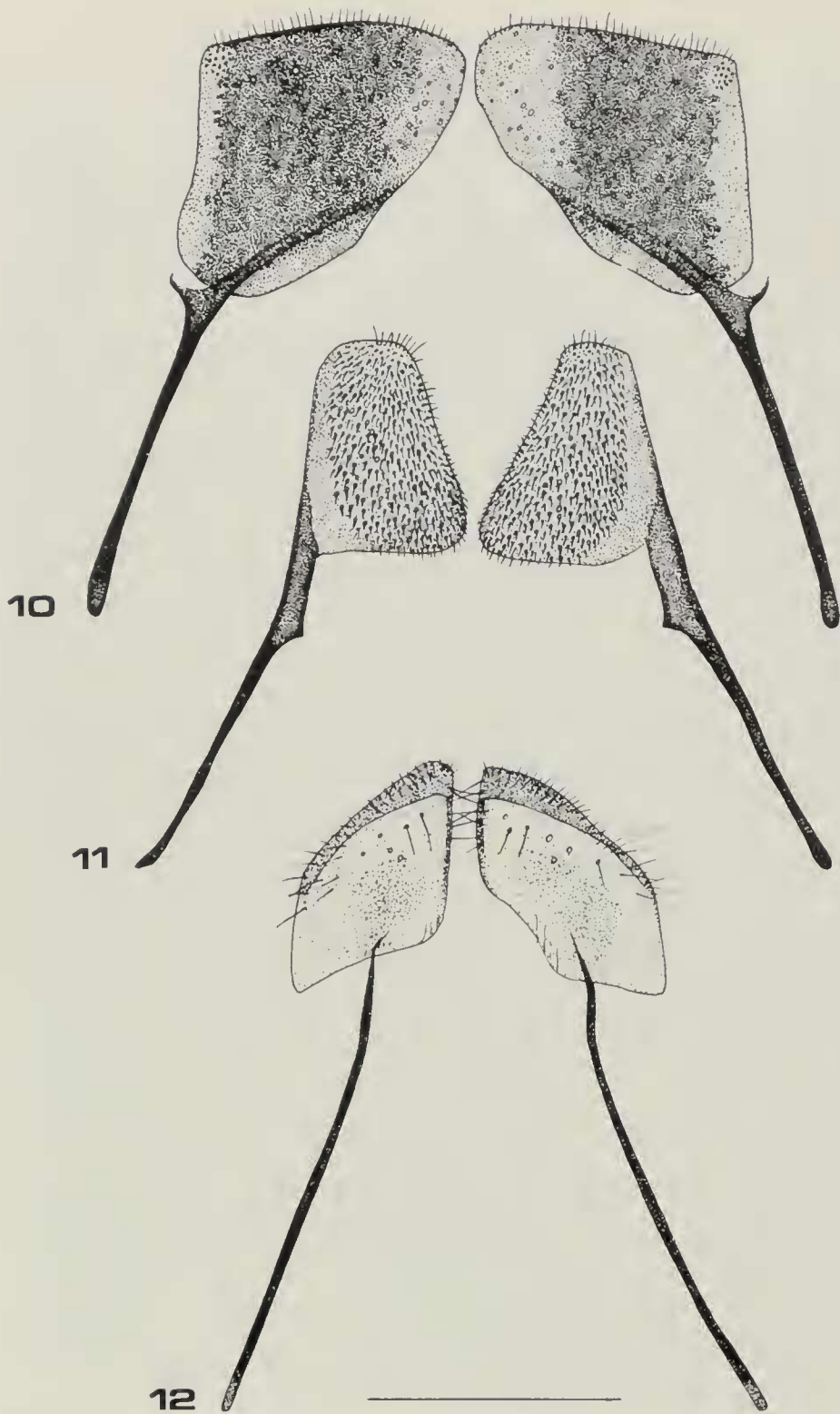


Figs. 1-9: *Thymelicus nova* (REVERDIN, 1916), 1-5 males, 6-9 females; Figs. 10, 15: *Thymelicus hamza* (OBERTHÜR, 1876), 10 male, 15 female; Figs. 11-14: *Thymelicus acteon* (ROTTEMBURG, 1775), 11-13 females, 14 male; Figs. 16-19: *Thymelicus lineola* (OCHSENHEIMER, 1808), 16-18 females, 19 male; Figs. 20, 25: *Thymelicus hyrax* (LEDERER, 1861), 20 male, 25 female; Figs. 21-24: *Thymelicus sylvestris* (PODA, 1761), 21-23 females, 24 male.

Plate 2

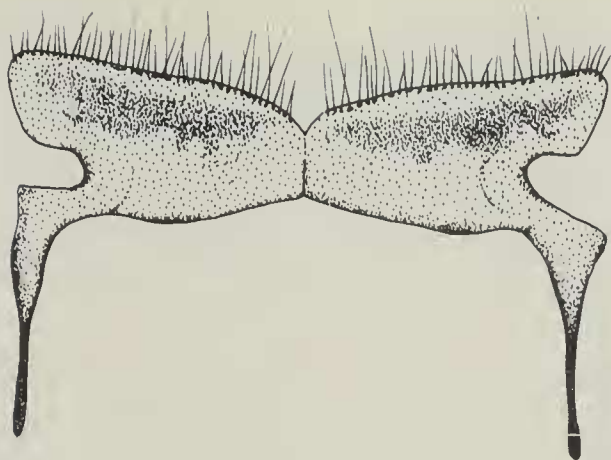


Same specimens as in plate 1, underside.

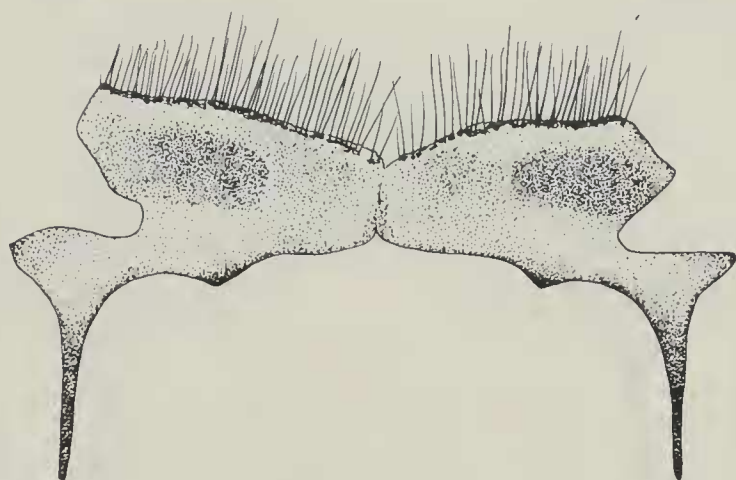


Figs 10-12: Papillae anales, apophyses posteriores: 10. *Thymelicus sylvestris* (PODA, 1761), same data as fig. 4; 11. *Thymelicus lineola* (OCHSENHEIMER, 1808), same data as fig. 5; 12. *Thymelicus hyrax* (LEDERER, 1861), same data as fig. 6; scale line 1 mm.

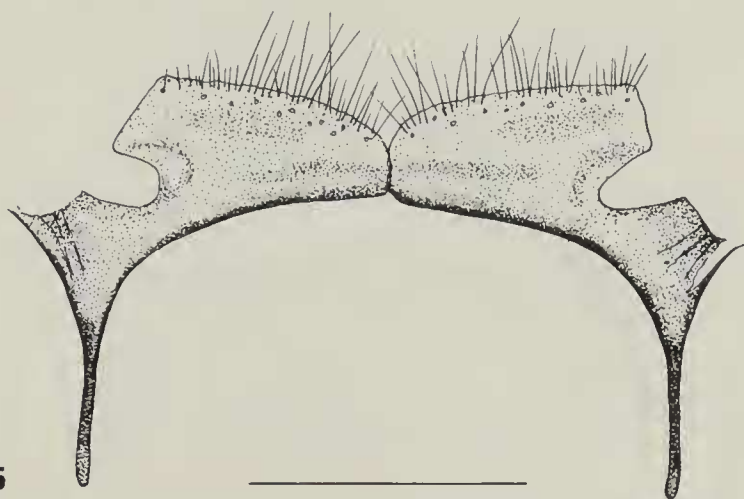
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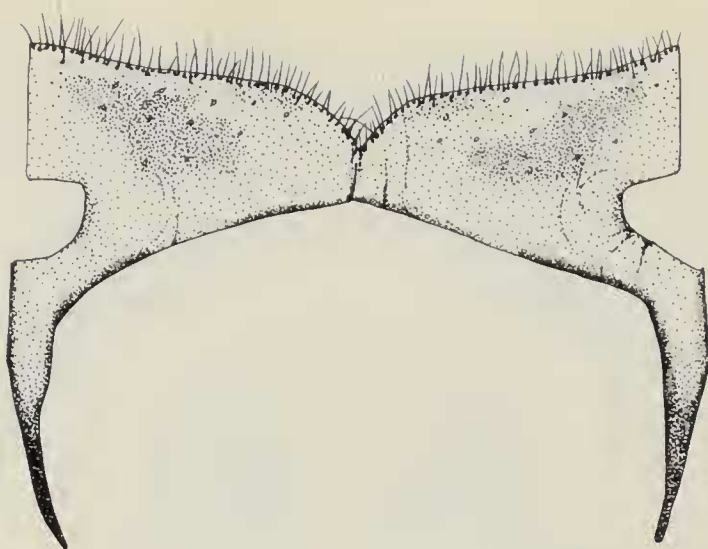


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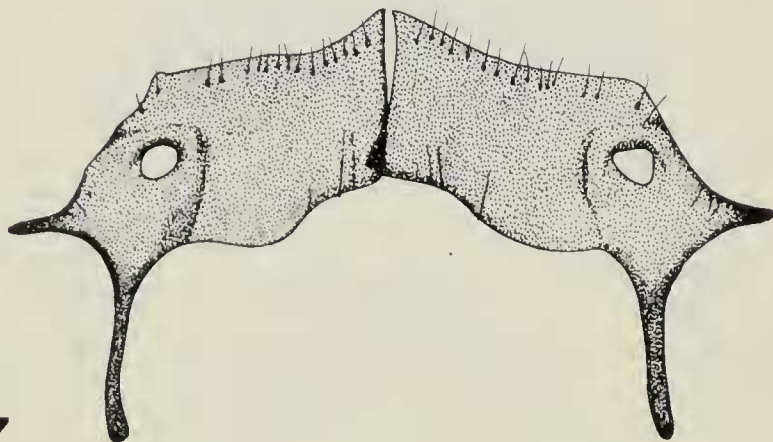


Figs 13-15: 8th tergite, apophyses anteriores: 13. *Thymelicus novus* (REVERDIN, 1916), same data as fig. 1; 14. *Thymelicus acteon* (ROTTEMBURG, 1775), same data as fig. 2; 15. *Thymelicus hamza* (OBERTHÜR, 1876), same data as fig. 3; scale line 1 mm.

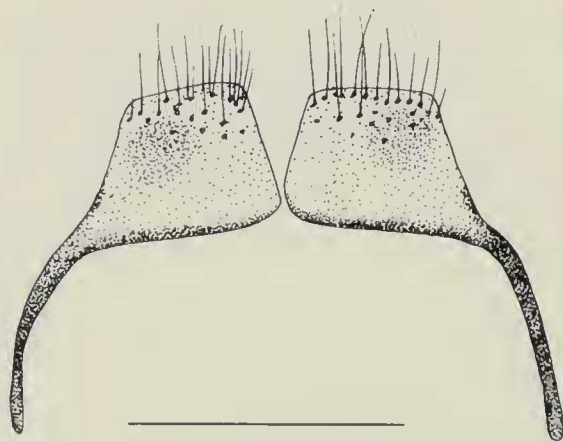
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18



Figs 16-18: 8th tergite, apophyses anteriores: 16. *Thymelicus sylvestris* (PODA, 1761), same data as fig. 4; 17. *Thymelicus lineola* (OCHSENHEIMER, 1808), same data as fig. 5; 18. *Thymelicus hyrax* (LEDERER, 1861), same data as fig. 6; scale line 1 mm.

T. acteon (figs 2, 8, 14):

Sterigma, colliculum and ductus, see DE JONG 1984: 154, fig. 16, and fig. 2 in this paper.

Papillae anales trapezium shaped, distal part with dense microtrichia, dorsally with some long spines; apophyses posteriores twice as long as distal part of papillae anales, hook at $1/3$ of distal end (fig. 8). 8th tergite almost rectangular, twice as long as wide, laterally with triangular incision, ventral side with triangular bulge; apophyses anteriores as long as greatest width of tergite (fig. 14).

T. hamza (figs 3, 9, 15):

Sterigma, colliculum and ductus, see DE JONG 1984: 154, fig. 15, and fig. 3 in this paper.

Papillae anales trapezium shaped, distal part with proximal hook and dense microtrichia, dorsally with some long, strongly sclerotized and some smaller spines; apophyses posteriores 2.2 times as long as distal part of papillae anales, hook at $1/3$ of distal end (fig. 9).

8th tergite almost rectangular, twice as long as wide, narrowing towards dorsum, costa with long hairs, laterally with round incision; apophyses anteriores 1.1 times as long as greatest width of tergite (fig. 15).

T. sylvestris (figs 4, 10, 16):

Sterigma, colliculum and ductus, see DE JONG 1984: 150, fig. 2, and fig. 4 in this paper.

Papillae anales triangular, central area more strongly sclerotized, costa with small hairs; apophyses posteriores 1.8 times as long as costa of papillae anales; hook at $1/3$ of distal end (fig. 10).

8th tergite almost rectangular, twice as long as wide, narrowing towards dorsum, costa with short hairs, laterally with round incision; apophyses anteriores almost as long as greatest width of tergite (fig. 16).

T. lineola (figs 5, 11, 17):

Sterigma, colliculum and ductus, see DE JONG 1984: 150, fig. 1, and fig. 5 in this paper.

Papillae anales trapezium shaped, dorsal area with dense spines; apophyses posteriores almost twice as long as length of papillae anales, hook at $1/3$ of distal end (fig. 11).

8th tergite rectangular, twice as long as wide, costa and ventral side concave, costa with few, short hairs, laterally with a hole and a strongly chitinated prolongation; apophyses anteriores as long as width of tergite (fig. 17).

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Boekbespreking

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17 x 24 cm, 205 p., 80 figuren, Verlag Eugen Ulmer, Postfach 70 05 61, D-7000 Stuttgart (Hohenheim), 1992, paperback, DM 58,- (ISBN 3-8001-2624-9).

De ecologie van planten heeft in de loop van de laatste jaren steeds meer belangstelling genoten, niet alleen door de rechtstreeks geïnteresseerden, maar ook door aanhangers van aanverwante disciplines. Zo zijn mensen die werkzaam zijn op het gebied van natuurbescherming en beheer van natuurreservaten niet alleen meer geïnteresseerd in een ellenlange soortenlijst, maar wel in een verklaring van de samenstelling van de flora van een bepaald terrein en de levenswijze van de verschillende planten die erin voorkomen.

Het hele boek is geen droge opsomming van leerstof, maar een aaneenschakeling van 149 proeven die ervoor zorgen dat de lezer gaandeweg wordt ingeleid in de veelzijdige materie van de plantenecologie. Het is daarbij niet nodig de systematische volgorde van het boek te volgen; men kan meteen bij het onderwerp van zijn keuze beginnen, want alle proeven zijn rond een aantal onderwerpen ingedeeld.

Een grote indeling verdeelt het boek in proeven met abiotische en met biotische factoren; de eerste worden op hun beurt onderverdeeld in edafische, klimatologische en emissiefactoren. Hierbij worden methoden besproken die de ecologische waarden van de bodem, het klimaat en de luchtzuiverheid bestuderen. In het tweede deel volgen methoden ter bestudering van ecologische waardebeoordelingen van de vegetatie zelf.

De beschrijving van een proef volgt over het algemeen steeds hetzelfde stramien : na een voorstelling van het onderwerp en de probleemstelling, wordt het principe van de methode uitgelegd. Meestal wordt aangegeven welke instrumenten men moet gebruiken en welke de proefopstelling is, wat precies gemeten moet worden en hoe dit moet gebeuren. Vele van de experimenten kan men zowel in het veld als in het laboratorium uitvoeren. Telkens wordt aangegeven hoe de proefopstelling is. Dikwijls wordt de uitleg verduidelijkt door een tekening of een schets. Verder volgt telkens een uiteenzetting over de verwerking van de verkregen meetresultaten. Soms worden voorbeelden gegeven zodat een onderzoeker kan toetsen of zijn resultaten overeenkomen met de algemeen gangbare meetresultaten.

Achteraan worden voorstellen gedaan om verschillende proeven met elkaar te verbinden zodat het mogelijk wordt een heel ecosysteem (b.v. een bos, een weide) te bestuderen in al zijn aspecten. Verder volgen een literatuurlijst, enkele tabellen met eenheden en omrekeningen en een zaakregister. Het boek is keurig uitgegeven, gebonden in slappe kaft.

Het werk is bedoeld voor alle biologiëstudenten in het algemeen, en meer in het bijzonder voor toegepaste biologen in de land-, bos- en tuinbouw, landschapsecologie, tuinarchitecten, conservatoren en beheerders van natuurreservaten enz.

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